IN THE CLAIMS

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for adaptively allocating ~~resource~~ resources in a communication system by subsequently ~~processing~~ performing sub-carrier/time slot allocation and modulation ~~method~~ selection processes, the method comprising the steps of:

a) computing average channel gains of sub-carriers/time slots for each user ~~by using~~ based on channel gains of sub-carriers/time slots for each user;

b) computing average numbers of bits of sub-carriers/time slots for each user based on ~~by using~~ required data rates and the computed average channel gains of sub-carriers/time slots for each user;

c) computing the number of sub-carriers/time slots to be allocated to each user based on the computed average numbers of bits of the sub-carriers/time slots for each user and allocating the sub-carriers/time slots to each user based on the computed average numbers of bits of the sub-carriers/time slots for each user and the computed number of sub-carriers/time slots to be allocated to each user; ~~and~~

d) selecting a modulation process to modulate data ~~method with respect to~~ according to a magnitude of ~~each~~ the sub-carrier/time slot allocated to each user; and

e) modulating data to be transmitted for each user through the selected modulation process, and transmitting said modulated data.

2. (Original) The method as recited in claim 1, wherein the average channel gain of each user in the step a) is computed by using an equation as:

$$\overline{\alpha_k}^2 = \frac{1}{N}\sum_{n=1}^{N}\alpha^2{}_{k,n}, \quad \text{for} \quad k = 1.....K$$

wherein $\overline{\alpha_k}^2$ is the average channel gain of sub-carrier for each user and $\alpha^2{}_{k,n}$ is the channel gain of sub-carrier/time slot for each user.

3. (Original) The method as recited in claim 1, wherein the average number of bits for each user in the step b) is a solution of K+1 non-linear equations formulated by an equation as:

$$\frac{\bar{c}_k f'(\bar{c}_k) - f(\bar{c}_k)}{\overline{\alpha_k}^2} = \varepsilon, \quad \text{for k=1,...,K}$$

$$\sum_{k=1}^{K} R_k / \bar{c}_k = N$$

wherein $\bar{c}_k$ is an average number of bits for each user, $f(c)$ is a power to receive c bits data within a range of bit error rate, and R_k is the total number of bits for each user.

4. (Original) The method as recited in claim 1, wherein the number of sub-carriers/time slots in the step c) is computed by using an equation as:

$$n_k = R_k / \overline{c_k}, \quad \text{for k=1,...,K}$$

wherein, n_k is the number of allocated sub-carriers/time slots for each user.

5. (Original) The method as recited in claim 1, wherein the allocation of sub-carrier/time slot in the step c) is an optimal solution of an equation as:

$$\text{Minimize } P_i - \sum_{k=1}^{K}\sum_{n=1}^{N} r_{k,n}\rho_{k,n}$$

$$\text{Subject to } \sum_{n=1}^{N} \rho_{k,n} = n_k, \text{ for all } k$$

$$\sum_{k=1}^{K} \rho_{k,n} = 1, \text{ for all } n$$

wherein $\rho_{k,n}$ is a variable number which determines whether a K-th user uses an n-th sub-carrier and $r_{k,n}$ is a cost for the K-th user to use the n-th sub-carrier.

6. (Original) The method as recited in claim 5, wherein the cost for the K-th user to use the n-th sub-carrier is determined by an equation as:

$$r_{k,n} = f(\overline{c_k})/\alpha^2{}_{k,n}, \text{ for } k = 1,...,K \text{ and } n = 1,...,N.$$

7. (Original) The method as recited in claim 5, wherein a linear optimal solution is solved by applying a Vogel's method.

8. (Currently Amended) A computer readable recording medium for storing programs ~~instructions~~ for executing a method for adaptively allocating ~~resource~~ resources in a communication system including a microprocessor by subsequently performing ~~processing~~ sub-carrier/time slot allocation and modulation ~~method~~ selection processes, comprising ~~the methods of~~ the steps of:

a) computing average channel gains of sub-carriers/time slots for each user based on ~~by using~~ channel gains of sub-carriers/time slots for each user;

b) computing average numbers of bits of sub-carriers/time slots for each user based on ~~by using~~ required data rates and the computed average channel gains of sub-carriers/time slots for each user;

c) computing the number of sub-carriers/time slots to be allocated to each user based on the computed average numbers of bits of the sub-carriers/time slots for each user and allocating the sub-carriers/time slots to each user based on the computed average numbers of bits of the sub-carriers/time slots for each user and the computed number of sub-carriers/time slots to be allocated to each user; ~~and~~

d) selecting a modulation process to modulate data ~~method with respect to~~ according to a magnitude of ~~each~~ the sub-carrier/time slot allocated to each user; and

e) modulating data to be transmitted for each user through the selected modulation process, and transmitting said modulated data.